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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,045	02/13/2004	Nobuji Kishimoto	S-2446.01/Div	3913

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H. Jay Spiegel & Associates PC
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EXAMINER

VALENROD, YEVGENY

ART UNIT	PAPER NUMBER
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1621

MAIL DATE	DELIVERY MODE
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06/09/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/777,045	Applicant(s) KISHIMOTO ET AL.	
	Examiner YEVEGENY VALENROD	Art Unit 1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-15 and 22-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-15 and 22-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Applicants' amendment to the claims filed 3/4/09 is acknowledged.

Applicants' remarks have been considered.

Rejections of claims 9-15 and 22-28 under 35 USC 112 second paragraph is withdrawn in view of applicants' amendment.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 9-15 and 22-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eastman et al (US 4,370,259) in view of Schlaefer et al. (US 4,078,004) and Croce et al (3,937,746)

Instant claims 9-15 are directed to a process for producing unsaturated aldehyde via two steps. Step 1 is vapor phase oxidative dehydrogenation of an alkane producing the corresponding alkene using catalyst of formula (1). Step two is vapor phase oxidation of the alkene in the presence of molecular oxygen and a molybdenum containing multimetal mixed oxide catalyst.

Scope of prior art

Eastman et al teach a process of oxidative dehydrogenation of ethane to ethylene in the presence of a catalyst containing mixed oxides of Mn, P and Na with an atomic ratio of 1:0.3 to 0.25:0.10 to 0.30 and a support (col 2, lines 7-41). Eastman et al. also teach that alkali metal can be introduced into the catalyst as a carbonate, bicarbonate or phosphate salts (column 2, lines 62-68). Temperature for the oxidative dehydrogenation is between 600 and 800°C (Column 3, lines 36-37), which overlaps the instantly claimed range of 250 to 650 °C (claim 15). The gas feed rate is between 200/hr and 1000/hr (column 3, lines 47-50) which encompasses the instantly claimed 300/hr - 30,000/hr. Eastman et al also teach drying their catalyst at 150 °C (column 4, line 21).

Ascertaining the difference between instant claims and prior art

Eastman et al teach the oxidative dehydrogenation of alkane to produce an alkene, but fail to teach oxidation of the alkene to produce an aldehyde or an unsaturated acid, which is the second step of the instantly claimed process.

Eastman et al. also fail to teach use of sulfate ion in the composition of the catalyst.

Secondary references

Croce et al.

Croce et al disclose an oxidative dehydrogenation catalyst containing sulfur as a promoter (abstract; column 2, lines 56-61)

Schlaefer et al.

Schlaefer et al. teach catalysts for conversion of alkene to aldehyde, particularly propylene to acrolein. The catalysts described include $\text{Mo}_{12}\text{Fe}_{4.5}\text{Bi}_{4.5}\text{As}_2\text{O}_x$, which is molybdenum-containing multimetal oxide catalyst.

Obviousness

One skilled in the art at the time the instant application was filed would have found it obvious to prepare an alkene using oxidative dehydrogenation method of Eastman and then react the said alkene using oxidation method of Schlaefer et al. The motivation to combine the two references is based on Schlaefer requiring an alkene starting material preparation of which is described by Eastman.

One would also find it obvious to include sulfur in the catalyst composition of Eastman. Croce et al teach beneficial properties of having a sulfur promoter present in the catalyst and Eastman teach that desired elements can be added as alkali metal

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salts (for example alkali phosphate is described in column 2, lines 62 – 68). One would therefore be motivated to follow the phosphate example and introduce sulfur as alkali sulfate.

Conclusion

Claims 9-15 and 22-28 are pending

Claims 9-15 and 22-28 are rejected

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yevgeny Valenrod whose telephone number is 571-272-9049. The examiner can normally be reached on 8:30am-5:00pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Sullivan can be reached on 571-272-0779. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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